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## **CALL FOR LETTERS OF INTENT** **BEEF CATTLE INDUSTRY SCIENCE CLUSTER IV** **2023-2028**

The Beef Cattle Research Council's (BCRC) mandate is to determine research and development priorities for the Canadian beef cattle industry and to administer national check-off funds allocated to research. The BCRC invites letters of intent for the fourth Beef Cattle Industry Science Cluster.

**The deadline to submit letters of intent is October 1, 2021 at 11:59 PM MT.**

The BCRC developed the first, second, and third Beef Cattle Industry Science Clusters under Agriculture and Agri-Food Canada's Growing Forward Strategy. The Clusters have brought together Canada's largest public and industry funders of applied beef research including AAFC, BCRC, provincial governments, provincial cattle associations, and other industry funders, focusing dollars and priorities on a comprehensive outcome-based research program directly aligned with industry's vision and priorities.

The BCRC is planning for the fourth Beef Cattle Industry Science Cluster under AAFC's next agricultural policy framework, which would cover the period **April 1, 2023 to March 31, 2028.**

### **Research Outcomes**

The BCRC has established clearly defined research outcomes for the fourth Beef Cattle Industry Science Cluster through a comprehensive stakeholder engagement process. Please refer to the research outcomes highlighted below before deciding to submit a letter of intent.

A webinar will be hosted by the BCRC on **August 4, 2021 from 10 am – 12 pm MT** to provide further explanation, project examples, and a Q&A session around the target Outcomes and Priorities for this call. We encourage researchers and others to attend if you are considering submitting an LOI.

[Subscribe to the BCRC Blog](#) to receive event details and a webinar link.

### **Application Forms and Information**

Letters of intent must be prepared using the file entitled 'BCRC Letter of Intent Form' provided by the BCRC and submitted electronically to [proposals@beefresearch.ca](mailto:proposals@beefresearch.ca). The form, as well as instructions and guidelines for submission, can be downloaded from [www.beefresearch.ca](http://www.beefresearch.ca). In the interests of improved funding efficiency, the BCRC reserves the right to share letters of intent with other research funders.

### **Project Timeframe**

Projects up to five years in length may be submitted. Projects will commence no earlier than April 1, 2023 (subject to AAFC approval of the Science Cluster) and must be completed by March 31, 2028.

### **Timelines**

**October 1, 2021** – deadline for submitting letters of intent

**November 19, 2021** – researchers will be notified on or prior to if they have been invited to submit a full proposal

**January 31, 2022** – deadline for submitting invited full proposals

**Early June 2022** – researchers will be notified of the BCRC's decision

## RESEARCH OUTCOMES

### DRAWN FROM THE FIVE-YEAR CANADIAN BEEF RESEARCH AND TECHNOLOGY TRANSFER STRATEGY

Through the [Five-Year Canadian Beef Research and Technology Transfer Strategy](#), the beef industry has defined several overarching core principles under which more specific outcomes are established:

1. Increase producer profitability by increasing productivity or decreasing costs of production and risks.
2. Develop, enhance, and encourage adoption of beneficial practices and innovations that maximize the environmental benefits industry provides and continue to reduce our environmental footprint, while supporting industry competitiveness.
3. Support continuous improvements in Canadian beef demand through advancements in the quality and safety of Canadian beef.
4. Generate science to inform decision makers, policy and best management practices and to support consumer confidence and public trust.
5. Develop, enhance, and encourage adoption of leading-edge technologies that support industry competitiveness, automation, and sustainability.
6. Ensure the maintenance and rejuvenation of critical research capacity and infrastructure that facilitate proactive inquiry and innovation to support industry advancement.

For the competition, the BCRC welcomes any letters of intent that work towards the achievement of one or more of the specific research priorities listed below.

#### Feed Efficiency and Utilization

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##### **Outcome 1: Improved feed efficiency through identification of genetic differences and animal breeding; detailed priorities include:**

- Develop and validate practical, accurate and cost-effective ways to quantify forage intake in grazing cattle and feed efficiency in the cow herd and the feedlot
- Validate genetic markers for feed efficiency in commercial crossbred cattle
- Identify genes with functional roles in microbiological and physiological processes affecting feed intake and efficiency in feedlot and cow-calf production
- Determine the impact of genetics, management, and environmental interactions on growth and reproductive efficiency

##### **Outcome 2: Investigate feed processing, by-products, additives, supplements, or other feeding strategies that optimize productivity and profitability; detailed priorities include:**

- Investigate feed processing methods and practices, additives, and management systems to improve digestibility, animal maintenance costs, and cost of gain
- Quantify the role and identify opportunities to further use cattle to upcycle and reduce food loss and waste

## **Forage and Grassland Productivity**

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**Outcome 1: Cost-effectively improve the agronomic performance, yields, nutritional quality, and palatability of annual and perennial tame species for grazing or stored forages; detailed priorities include:**

- Develop strategies and best management practices to promote stand productivity and longevity, preserve forage quality, and prevent waste in stored forages
- Develop and evaluate new varieties with improved germination, emergence, yield, digestibility, salinity, drought and flood tolerance, reduced fall dormancy, and improved winter hardiness and plant persistence

**Outcome 2: Better understand the impact of grazing management on plant, animal, and soil interactions and how the overall system contributes to plant and animal health and productivity; detailed priorities include:**

- Quantify the impact of agronomic and grazing management practices on economic and environmental outcomes such as plant health, forage yields and quality, animal health and performance, soil carbon sequestration and organic matter, soil health and quality, water infiltration and nutrient cycling in different ecoregions of Canada
- Identify simple, practical, cost-effective indicators of soil quality that have impacts on forage quality and productivity
- Evaluate long term effects of incorporating grazing on crop production land

**Outcome 3: Improve the management and productivity of native/naturalized pastures to enhance profitability and discourage land conversion; detailed priorities include:**

- Identify practices that optimize utilization and resilience of pastures which may include indicators of appropriate recovery times

## **Environment: Soil Health, Water, Biodiversity**

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**Outcome 1: Develop cost-effective ways to reduce greenhouse gas emissions, maintain or improve biodiversity, increase soil carbon, or improve water infiltration on pastures and rangeland; detailed priorities include:**

- Validate grazing practices that improve water infiltration, forage yield, and soil organic matter in Canadian conditions across a variety of ecoregions
- Evaluate the roles of the soil microbiome and plant-soil interactions in short-, medium-, and long-term soil carbon storage and sequestration, plant yield, and water holding capacity
- Develop simple outcomes- and systems-based approaches for producers to understand and quantify the costs and benefits of environmental best management practices
- Investigate cost effective ways to reduce greenhouse gas emissions on pasture or forage-based systems

**Outcome 2: Develop cost-effective ways to reduce feedlot greenhouse gas emissions and evaluate the impacts of manure nutrients on pasture and cropping systems; detailed priorities include:**

- Evaluate supplements, strategies, and practices used to reduce greenhouse gas emissions in the

- feedlot using a systems approach
- Quantify the effectiveness of forages to mitigate nutrient mobility associated with extended winter grazing practices

**Outcome 3: Identify cost-effective ways to improve air, water and soil outcomes associated with beef packing and processing facilities; detailed priorities include:**

- Develop and validate cost effective cleaning technologies that reduce water and sanitizer use in packing plants

## **Animal Health, Welfare and Antimicrobial Resistance**

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**Outcome 1: 92% of cows wean a calf each year through cost-effective improvements in nutritional and overall management; detailed priorities include:**

- Refine nutritional and related management strategies to improve rebreeding success, calf survival and herd retention in replacement females
- Clarify how management practices impact reproductive performance in cattle that differ in their genetic potential for growth, efficiency, and carcass traits

**Outcome 2: Improved prevention and mitigation of animal disease issues; detailed priorities include:**

- Develop vaccines and delivery systems to cost-effectively prevent economically important production-limiting diseases
- Develop point-of-care and other diagnostic tools that rapidly, accurately, and cost-effectively identify infectious disease, immune/vaccination status, antimicrobial susceptibility/resistance, or nutritional status
- Use new techniques and traditional microbiology to understand the role of the microbiome(s), their development and interactions, and learn how they can be manipulated to help prevent, mitigate, and manage major diseases
- Identify and quantify biosecurity and animal health risks associated with transport rest stops and other co-mingling sites

**Outcome 3: Improved prevention and mitigation of animal welfare issues; detailed priorities include:**

- Develop cost-effective and easily administered options to alleviate procedural pain associated with castration, branding, and dehorning
- Develop cost-effective chronic pain management strategies
- Identify factors contributing to lameness, develop cost-effective preventions, treatment options, and methods to control or limit environmental spread of the pathogens involved

**Outcome 4: Effective surveillance of production limiting diseases, production practices, and antimicrobial use and antimicrobial resistance; detailed priorities include:**

- Support ongoing surveillance of management practices and animal health and productivity information at the cow-calf level across Canada

**Outcome 5: Develop and promote the adoption of cost-effective management practices and technologies that reduce the need for and preserve the effectiveness of antibiotics; detailed priorities include:**

- Continued development of alternative health products and management practices to maintain animal health and reduce the need for antibiotic treatment
- Understand how stress (e.g., transportation, marketing, commingling, social dynamics) impacts the ability of cattle to acclimate to new environments
- Assess how nutritional and health management (e.g., vaccination) of the cow herd impacts calf health pre- and post-weaning

## **Beef Quality**

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**Outcome 1: Improved customer satisfaction with Canadian Beef; detailed priorities include:**

- Modernize and conduct a National Beef Quality Audit that reflects the industry's evolution from carcass-based to cut-based marketing
- Develop and implement processes and technology to capture carcass quality defect data at processing plants in real-time

**Outcome 2: Define, validate, and enhance the emotional and functional attributes of Canadian beef in domestic and international markets; detailed priorities include:**

- Develop objective measures to assess the eating quality of specific primals/cuts desired in high-value export markets
- Develop and conduct industry-led consumer sensory comparisons and cut performance of equivalent Canadian and competitors' products in domestic and international markets

## **Food Safety**

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**Outcome 1: Ensured food safety along the beef supply chain; detailed priorities include:**

- Develop and implement cost-effective technologies targeting multiple pathogens in cattle and beef production and processing facilities, including heat- and acid-resistant E. coli and biofilm forming bacteria
- Identify key spots in processing plants that are prone to contamination and difficult to clean, and develop alternative designs, surfaces, and cleaning strategies to facilitate effective cleaning
- Proactively (re)assess the prevalence of Salmonella in Canadian slaughter cattle, carcasses and beef, and develop strategies to effectively reduce food safety risks

**Outcome 2: Validate the efficacy and safety of new technologies in support of the rational regulatory approval and adoption of improved food safety interventions throughout the supply chain; detailed priorities include:**

- Develop cost-effective cleaning technologies that reduce the need for (hot) water, sanitizers, and labor in large and small processing facilities